Arguments Against Rejections

Claims 1, 5-7, 11-13, 18, 19, and 21 are presently amended. Amendments are supported by the original specification, figures, and claims. Arguments are presented in light of amendments to referenced claims.

Claim 20 was withdrawn in previous reply to prior restriction/election requirement.

CLAIM REJECTIONS – 35 U.S.C. § 102 & 35 U.S.C. § 103

Claim 21 is rejected under 35 U.S.C. § 102.

Claims 1-19 are rejected under 35 U.S.C. § 103.

The rejections are traversed.

Argument No. 1

Yoshiharu neither describes nor suggests the porous mat provided in claims 1-19 and 21.

By way of background, the present invention includes a porous mat composed of optical fibers. The optical fibers are weaved or intertwined to form a porous structure. Accordingly, the end emitting optical fibers are disposed within the porous mat in a random and non-parallel arrangement. Gaps or spaces between optical fibers within the weave or mesh allow air to traverse the porous mat, yet facilitate the entrapment of particulates. In the present invention, the optical fibers are end emitting which prohibit ultraviolet light from "leaking" through the side walls along the length of the fibers. Rather, ultraviolet radiation is emitted from one end of each optical fiber within the porous mat so as to neutralize particulates trapped between two or more optical fibers.

This approach concentrates the emitted light and maximizes neutralization; however, the concentration of light by end emitting fibers frustrates the formation of a light field across the porous mat. The random orientation of fiber ends within the porous mat avoids this problem.

Each optical fiber has a first end and a second end. The first ends are arranged in an ordered fashion and thereafter bundled along one or more edges of the porous mat, as represented in FIG. 3. First ends are oriented towards an ultraviolet tube so that ultraviolet radiation is communicated into each optical fiber. The second ends terminate within the porous mat. Second ends are oriented so as to project a plurality of ultraviolet beams. Ultraviolet beams overlap to form a contiguous field within and/or adjacent to the porous mat, as represented in FIG. 4 of the specification. The claimed invention differs from the related art in that the porous mat is illuminated via light emitted from the ends of the optical fibers rather than via light emitted through the side walls of the fibers.

Fibers which allow light to leak through the side walls widely disperse ultraviolet radiation conveyed by the fibers, thus diminishing the neutralization efficiency of the ultraviolet light.

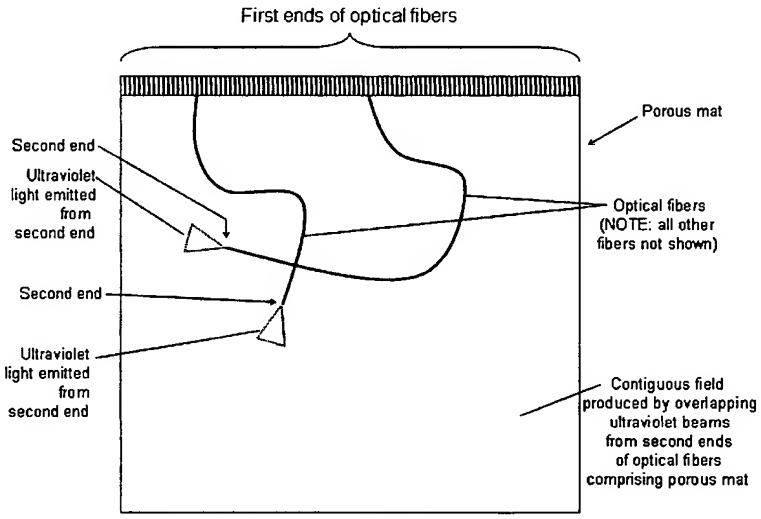
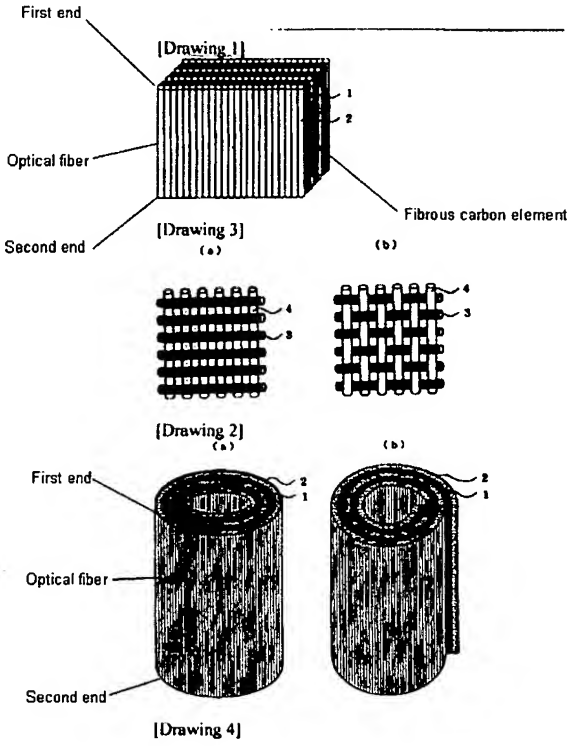


Fig. A

FIG. A shows an exemplary orientation of two optical fibers within a porous mat

composed of a plurality of woven or intertwined optical fibers. Also shown is the bundled orientation of first ends and second ends disposed within said porous mat.

Yoshiharu describes a photocatalyst filter used within air cleaners, sewage treatment units, and water purifiers. The filter includes the layered arrangement of fibrous carbon elements with photocatalyst (1) and optical waveguides (2), as shown in Drawing 1 of Yoshiharu below. Fibrous carbon elements and optical waveguides are separately arranged in parallel configurations. In Drawing 3 of Yoshiharu, fibrous carbon elements (3) and optical waveguides (4) are oriented in a 90 degree offset, yet parallel, configuration. Furthermore, the optical fibers in Yoshiharu are neither woven nor intertwined with other optical fibers, but rather woven with the fibrous elements. In the present invention, optical fibers are woven or intertwined with other optical fibers in a random and non-parallel arrangement.



In Yoshiharu, optical fibers are oriented lengthwise and parallel so as to traverse the height of the filter element, as shown in Drawings 1-3 above. The ends of the optical fibers terminate at the lateral extent of the filter element. As such, Yoshiharu must communicate light from each optical fiber to a photocatalyst material within the filter via the leakage of light through the side walls of the fibers. Yoshiharu states:

> It is desirable for light to leak gradually as the light which carried out incident spreads inside a filter the optical waveguide used by this invention. *Paragraph 17, Lines 1-2.*

> Since such a fiber has the very big cross section of the cross-section ****** clad of a core, the light of the large quantity can be made to spread by using a clad for propagation of light. In order for light to spread with leakage moderately furthermore, it is not necessary to control the angle of incidence of light or to bend an optical fiber. Moreover, since the construction material of a clad is a quartz with the high permeability from the light to ultraviolet radiation, even when ultraviolet radiation uses a required photocatalyst for excitation light like TiO2, it is possible to make ultraviolet radiation spread efficiently. *Paragraph 18, Lines 3-9.*

Accordingly, Yoshiharu teaches away from end emitting optical fibers because proper function of Yoshiharu requires light to be dispersed through the side walls of the parallel arranged optical fibers.

Referring to Drawings 1and 3, the optical fibers (2) are clearly shown traversing the height of the filter so that first and second ends do not terminate <u>within</u> the filter, as provided in the present invention. As such, Yoshiharu neither describes nor suggests a porous mat composed of a plurality of woven or intertwined optical fibers in a random and non-parallel arrangement, each having a second end which communicates an ultraviolet light beam from the end thereof so as to form a contiguous field of ultraviolet radiation within the porous mat.

There is absolutely nothing in Yoshiharu and the other references that describes the claimed structure in independent claims 1, 7, 13, and 21. But rather, Yoshiharu alone and in combination with the other references discloses a device including a parallel arrangement of optical fibers and carbon elements which form a structure that communicates light to a photocatalyst via leakage through the side walls of optical fibers.

For these reasons, it is respectfully submitted that Section 102 and 103 rejections of claims 1-19 and 21 are misplaced, and reconsideration and withdrawal of the same are respectfully requested.

Argument No. 2

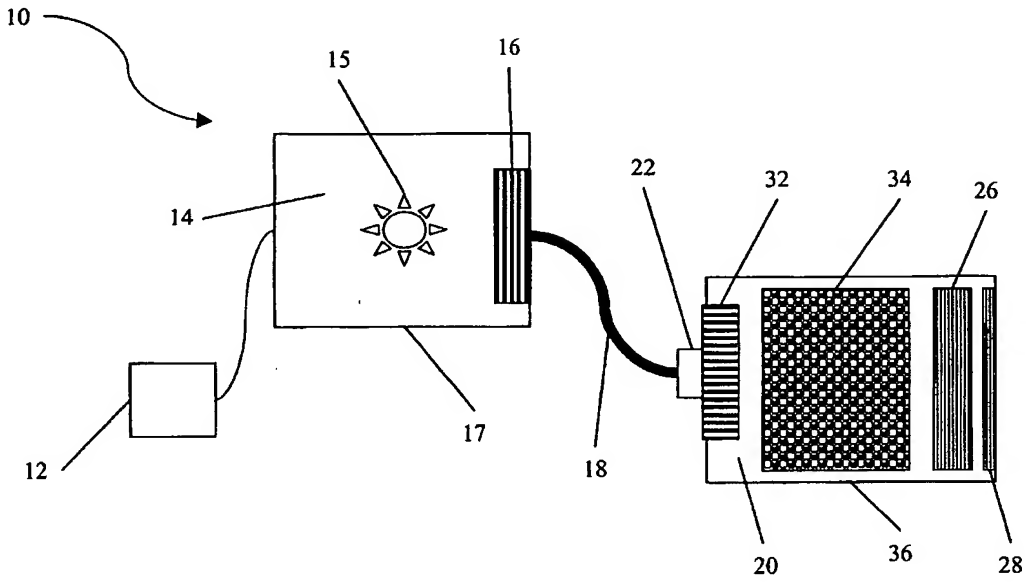
Horton, III neither describes nor suggests the optical fibers with lens provided in claims 5, 6, 11, 12, 18, and 19.

By way of background, the present invention as provided in claims 5, 6, 11, 12, 18, and 19 includes a lens shaped structure at the first end and the second end of each optical fiber, as represented in FIGS. 5b and 5c. At the first end, the lens structure focuses light into the optical fiber. At the second end, the lens structure either diffuses or focuses light projected from the end of the optical fiber. The end of the optical fiber is either chemically etched or mechanically ground to produce the lens structure.

Horton shows a UV system in FIG. 1 which is further described in the text referenced below.

> In the preferred embodiment, a power supply 12 powers a UV light source 14. The UV light source is composed of a UV lamp 15, source optical components 16, and a housing 17. UV light generated by the UV lamp 15 contained within the housing 17 is focused and controlled by the means of the source optical components 16 into at least one UV transmission line 18 that connects to the gas stream purifier 20 at a portal 22, which may

alternatively be at least one portal if more than one light input is desired, thus transmitting UV light to the gas. The gas stream purifier portal is equipped with optical components, or portal optics, 32 that further control the UV light at the gas stream purifier 20 in order to provide additional focus and/or control of the UV light for the disinfection of the gas stream (not shown). *Column 4, Lines 56-67 through Column 5, Lines 1-4.*



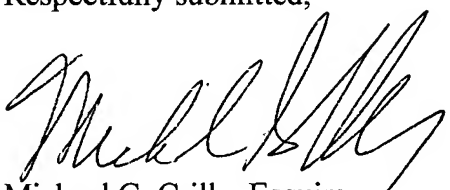
The optical component 32 described by Horton is a component which resides between the UV transmission line 18 and dose zone 34. As such, the optical component 32 is a device separate and distinct from the UV transmission line 18; whereas, the lens structure in the present invention is an integral part of the optical fiber. Accordingly, Horton neither describes nor suggests the lens structure at the end of an optical fiber as provided in claims 5, 6, 11, 12, 18, and 19. Further, there is absolutely nothing in Horton and the other references that describes the claimed structure in claims 5, 6, 11, 12, 18, and 19.

For these reasons, it is respectfully submitted that Section 103 rejections of claims 5, 6, 11, 12, 18, and 19 are misplaced, and reconsideration and withdrawal of the same are respectfully requested.

Concluding Remarks

In view of the above, it is submitted that amended claims are in condition for allowance. If, after reviewing the above, Examiner believes any issues remain unresolved, the favor of an Examiner interview is requested and the Examiner is requested to contact the undersigned, by telephone, to schedule the same.

Respectfully submitted,



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